Logical Evolution of the Military Decision Making Process

A Monograph
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14. ABSTRACT

This monograph explains the ability of the military decision-making process to inform the decision-maker in the current operational environment. A comparison of the operational environment, as envisioned through the U.S. Army?s doctrine, before and after the end of the Cold War establishes the framework by which commanders makes decisions. Moreover this comparison highlights the critical changes in that environment that the MDMP has yet to account for. Next, an analysis of naturalistic decision-making theory provides insight into how commanders inform the decisions they make. Subsequently, the military decision-making process (MDMP) is analyzed to determine the advantages and disadvantages of the process as compared to the current operational environment and the way experienced commanders naturally make decisions. This analysis establishes the logical evolutionary steps the MDMP must make in order to be a viable decision-making process in the current operational environment The fundamental dilemmas of decision-making within the U.S. Army are five fold. First, there currently is little experience within the U.S. Army at the operational level. Yet, since the end of the cold war the U.S. Army is increasingly becoming involved at the operational level of war, as the shift in focus of the Army?s doctrine indicates. Second, Joint Doctrine does not prescribe a methodology for decision-making that is fundamentally different from the tactical MDMP contained in U.S. Army doctrine. Because of the deficiency in Joint Doctrine it is logical that a U.S. Army planner, for example, operating in a Joint Task Force (JTF) Headquarters will utilize the only decision-making process that the planner is familiar with?the MDMP. Yet the MDMP is a tactical process. Third, the MDMP was a tactical decision-making process designed for the pre-cold war, tactical U.S. Army. However, the post-Cold War environment is more focused on the operational level. Fourth the MDMP was potentially time-consuming, yet functioned-well in complex and uncertain environments. Yet, the current environment mandates a decision-making process that operates in a time-compressed environment. Finally, the MDMP, along with all analytic methods of decision-making, did not accurately model the way experienced decision makers naturally made decisions. Yet, decision-makers typically use their experience to develop single COA that will correct the problem Moreover the theories of decision-making state that when the experience level is high, relative time pressure is high, and uncertainty is high that the RPD model best describes the manner in which decision-makers decide. However, the model that describes which decision-making method (rational or recognitional) had better applicability, given a set of circumstances, does not account for all possibilities within the continuum of decision-making. Specifically, the continuum does not account for the instance were experience was low, staff experience was low, relative time high, and uncertainty high?interestingly enough a mark on the continuum that replicates a U.S. Army Corps operating as a JTF HQ?s during a crisis. This monograph concludes that the MDMP needs to evolve to account for the operational focus of the U.S. Army, the MDMP needs to provide synthetic experience to commanders and their respective staffs, who lack operational experience, and the MDMP must promote a shared vision between the commander and staff. The technique suggested to correct this shortfall during the MDMP is wargaming?but not the traditional application of wargaming as prescribed in current U.S. Army doctrinal manuals.

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I. INTRODUCTION

In the 1980s the United States Army's conceptualization of the battlefield was analogous in many ways to a chessboard. Good guys began on one side of the board, each unit represented by a piece on the chessboard which shared a common boundary with an adjacent friendly force on its left and right. Additionally, the forces were echeloned in depth. In the front of the formation were the scouts; behind the scouts were the maneuver units, each with its own movement and firepower capability. The bad guys were on the other side of the board. Though their employment tactics were different, their battlefield organization, echelonment and boundaries, looked very similar. In the middle of the board was the main battle area (MBA) where close operations were conducted. It also contained the area known as the forward line of troops (FLOT), the trace of which reorients as units move in the space and time continuum to achieve the aim assigned to them.

Pawns were initially moved toward the middle of the board, representing scouts moving within the main battle area, in order to determine the disposition and aim of the opposing side, and to secure keys squares on the board (key terrain). As the enemy disposition and aim unfolded, the player, representing the commander, made decisions that disrupted the enemy aim and allowed him to impose his will on his opponent through effective movement and fire.

In order to effectively move and fire, the player, much like a military commander, engaged in a mental process that enabled him to make quantitatively and qualitatively better decisions than his opponent. The player assessed the current enemy and friendly strength and disposition. Each player then determined the opponent's possible moves, analogous to the intelligence preparation of the battlefield (IPB). With this information each player determined a series of sequential moves through space and

time that disrupt or defeat the aim of his opponent and allowed the player to impose his will through the execution of a chosen course of action (COA). Three types of operations categorize the sequencing of moves. First the player ensured that his King (the center of gravity) was protected (analogous to rear operations). Second the player conducted a series of battles in the middle of the board (analogous to close operations) that allowed him to continue his movement. Finally the player conducted operations against key pieces on the board that he will eventually have to fight in the MBA (deep operations).

The environment of the sixty-four square chessboard bounded the problem for the commander. In effect, the complexity of the problem was definable. Actions of both players occurred in a contiguous environment. Additionally, the operations conducted were linear in nature and followed established rules. Moreover, the skilled player could visualize, with a fair degree of accuracy, the potential actions of his opponent and make both proactive and reactive movements to counter those actions.

Since 1990, the increased lethality and precision of weapon systems have expanded the size of the military chessboard. Additional chessboards were connected to the original chessboard, expanding the theater of operations.[1] The commander also made strategic decisions that complicate his ability to rapidly move his units on the chessboard. Recently, the friendly commander decided he could remove his players from the chessboard, since he possessed the ability to project his forces, given time, to any chessboard. A second order effect of this reliance upon force projection was that the enemy opponent had the opportunity to watch how the friendly commander would project force by observing the employment of the friendly commander's forces against other foes. The opponent realizes critical vulnerabilities and capabilities that the friendly commander possesses and needs. The opponent realizes that with an economy of force, his forces can block the ports, both air and sea, that the friendly commander needs in order to gain access to the military chessboard. Additionally, the opponent

determines that dispersion of the enemy force helps to negate the technological advantage the friendly commander's force possesses.

No longer are the chessboards connected, they are in fact separated in time and space. The potential enemy dispersed his forces and conducted operations during times that mitigate the technological advances of the friendly commander's forces. Concurrently, the enemy commander has diminished the friendly commanders ability to gain access to the military chessboard. The friendly commander now finds his forces separated, in space, on multiple chessboards and operating along multiple lines without geographical reference to other friendly subordinate forces on the same chessboard. Additionally, actions taken by either friendly or enemy force may have decisive impact on actions taken on another chessboard. The friendly commander wrestles with a myriad of complex decisions associated with how the friendly forces will operate in order to achieve the overall aim of the conflict.[2] Suddenly, the complexity of the military chessboard has increased exponentially.

A commander in 2001 ponders what techniques might help him with better decision-making in this new complex environment. Commanders still use the tried and true methodology of military decision-making. Now the techniques he so doggedly applied in the past to make good decisions are not as effective. Synchronizing battle systems, forecasting future events, establishing a shared vision, and shaping the battlespace for future operations have all become extremely complex in this uncertain environment. The complexity and uncertainty represented in the chessboard analogy illustrates the potential dilemma facing future commanders in the U.S. Army and calls to question the doctrinal method by which commanders make decisions. Specifically, does the current decision-making process inform decision-making in the current operational environment? The author answered this question by

analyzing three areas: the operational environment, decision-making theory, and decision-making doctrine.

This author used U.S. Army doctrine as a lens to establish the characteristics of the current operational environment. The characteristics of the environment need to be understood because they affect the way the commander makes decisions. This author suggests that a change in the operational environment occurred after the end of the Cold War in 1991. The operational environment pre 1991 had a tactical focus, was linear and contiguous, like the first chessboard analogy. The subsequent operational environment that followed the end of the Cold War had an operational focus, was nonlinear and noncontiguous like the multiple, detached chessboards. Therefore the 1986 version of *Field Manual (FM) 100-5, Operations,* is compared to the 2001 operational doctrine, *Student Text, 3-0, Operations*, to distinguish the new characteristics of the current operational environment. A review of decision-making theory identifies critical aspects of how commanders make decisions and what they need to make those decisions.

In order to analyze and suggest changes to military decision-making one must understand decision theory and how good decisions are made. This monograph will use a variety of sources, such as Gary Klein's, *Sources of Power*, to establish the theoretical framework of decision-making.[3] Klein's decision-making theory establishes they way decision-makers naturally make decisions. This author suggests that U.S. Army decision-making processes should mirror the natural way commanders will make decisions. Additionally, the naturalistic model suggests that decision-makers rely greatly on their personal experience. The reliance on experience can be problematic given the current operational environment—suggesting a critical task for the current decision-making process. Analysis of the current military decision-making process (MDMP) identifies the strengths and weakness of the current process.

The U.S. Army's current decision-making model, referred to as the military decision-making process (MDMP), is found in U.S. Army doctrine in the 1993 version of *FM 101-5, Staff Organizations and Operations*, doctrine written during the Cold War era. The end of the Cold War suggests that the MDMP needs to account for the new characteristics current environment.

Additionally the MDMP mirrored the classical analytical decision-making process. This process worked-well when time pressure was low, experience was low and an optimal solution is desired. Moreover the MDMP is viewed both doctrinally and in practice as a linear process. It is this view that hinders the MDMP to be a functional model in the contemporary environment. *ST 6-0, Command and Control*, draft doctrine, establishes the inherent relationship and complexity of the operational environment, decision-making and the military forces. Specifically, it states, "The dynamic relationship among these factors create the complexity of operations: friendly forces, enemy forces, and the environment.[4] This statement highlights the dynamic interplay of the environment and decision-making.

By establishing the characteristics of the new operational environment and the fundamentals of good decision-making theory, the author established three evaluation criteria to analyze the MDMPs ability to inform decision-making. The first criterion was the ability of the MDMP to function in a time-compressed environment. This criterion was necessitated by the characteristics of the operational environment. The next criterion was the ability of the MDMP to fill experience voids. The need for the second criterion comes from the lack of operational level experience of division and corps commanders—the very level the U.S. Army has found itself operating in since the end of the Cold War. Finally, the third criterion was the ability to establish shared mental models between the commander and staff. This criterion was necessitated to mitigate against the vast complexity and uncertainty of the

operational environment and to ensure that the staff can execute the commander's vision of the operation.

The conclusions drawn from this analysis of the MDMP will answer the basic monograph question: does the current tactical decision-making process inform decision-making in the current operational environment? The author concludes with a new way to view the MDMP to account for the operational environment and the way commanders make decisions.

II. OPERATIONAL ENVIRONMENT

The operational environment influences the process by which leaders made decisions. A dynamic change in the environment has considerable impact on the decision-making process. Such a change occurred with the collapse of the Soviet Union in 1991. The loss of the bi-polar world subsequently replaced by a multi-polar world with only one remaining super-power has had profound impact on the United States military.[5] The effect of this change in the operational environment has found the U.S. military involved in regional conflicts and stability operations throughout the world in response to the national military strategy of prepare, shape, and respond.[6]

Several factors characterize the new operational environment. First the new operational environment encompassed untold levels of complexity. The impact of the political, threat, informational and technological dimensions all have contributed to this new level of complexity. Secondly, the environment contains higher levels of uncertainty, generated by the interplay of the political and threat dimensions. Finally, the time-compression exhibited by this new environment will have profound impact on the way decisions were made. Moreover, the continued acceleration of the informational and technological dimensions will only compound the temporal compression, complexity and uncertainty associated with this environment. There were several options to compare the operational environments

found before and after the fall of the bi-polar war, for example historical or doctrinal comparisons. The doctrinal comparison was chosen since it seemed to the author to offer a better military perspective of the operational environment the U.S. Army doctrine writers envisioned.

Initially, the author considered a comparison of the 1993 version of *FM 100-5, Operations* to *ST 3-0, Operations*. The selection of these two manuals seemed obvious. Specifically, *ST 3-0, Operations* was touted as a revolutionary manual.[7] The logical deduction from this advertisement was that the operations manual prior to *ST 3-0, Operations,* the 1993 version of *FM 100-5 Operations,* was significantly different from its replacement. The 1993 version of *FM 100-5, Operations* was compared to the current manual *ST 3-0, Operations* to distinguish the new characteristics of the current operational environment. Although, the initial research revealed that many of the new characteristics contained in *ST 3-0, Operations*, had roots in the 1993 version of *FM 100-5, Operations,* some new concepts emerged in the 1993 version. It was worthwhile to make a brief comparison of the 1993 version of *FM 100-5, Operations,* and *ST 3-0, Operations* because it highlights the point in time when doctrine writers began to acknowledge, through doctrine, the changing operational environment.

ST 3-0, Operations formally established several new doctrinal concepts and expanded others. Specifically, three concepts were germane to this monograph: the elements of operational design, the dimensions of the operational environment, and the operational framework.[8] The elements of operational design were a good example of the common thread between the two initially compared manuals. *ST 3-0, Operations,* listed nine elements that make-up operational design. Of those nine elements, five were new to the 1993 list contained in *FM 100-5, Operations.* The five new elements were operational reach, approach, and pauses; simultaneous and sequential operations, linear and

nonlinear operations; and tempo.[9] Further comparison revealed that each of these concepts was in fact contained in the 1993 version of *FM 100-5, Operations.*[10]

Many other examples exist that demonstrate the close ties between the two manuals. The new concept of noncontiguous AO was actually conceived in the 1993 version. which, stated, "although deep, close, and rear operations may not be contiguous to one another, commanders do not allow enemy forces freedom of movement within the gaps formed by extended noncontiguous battles."[11] However, *FM 100-5 Operations* did not envision everything contained in *ST 3-0, Operations.* A quick comparison of the dimensions of the operational environment dispels the notion that the 1993 version foreshadowed the entire new operational environment.

The similarities between the two manuals do highlight that the doctrine writers of the 1993 version of *FM 100-5, Operations* were already grappling with characteristics of the new operational environment that had emerged since the fall of the bi-polar world. The U.S. Army was in fact attempting to deal with a new operational environment. In order to more accurately distinguish the new operational environment, the doctrinal comparison originally of 1993 and 2000 manuals proposed by the author was changed to a comparison of the 1986 version of *FM 100-5, Operations* and *ST 3-0, Operations.*

An immediate difference between the two doctrinal manuals was how the operational environment was defined. The 1986 version, based on the Airland Battle Doctrine, did not directly identify the elements of the operational environment. However there were concepts in the 1986 version that ultimately became elements of the current definition. Specifically the manual established two dimensions of the environment--the moral and the physical.[12]

Moreover the 1986 version identified the two types of physical environments the U.S. Army were likely to operate in:

> Operations in the foreseeable future will be fought in one of two basic environments. One environment may be an anticipated theater of war with an existing support structure of communications, air defense, logistic facilities, and ports. The other may be a relatively immature theater where Army leaders within a joint or combined context will have to choose between creating such a support base in the theater or fighting with only external support.[13]

The focus of the 1986 version of *FM 100-5,* Operations, on the physical environments, defined by the moral and physical dimension combined with the purely tactical focus of future Army operations highlight the tactical focus of that manual.

Conversely, the 2001 version of *Student Text 3.0, Operations,* reflective of the increased complexity associated with the operational environment since the end of the cold war, identified six dimensions that U.S. Army forces currently operate in, they were: threat, political, unified action, land combat operations, information, and technology dimensions.[14] These dimensions have had a profound impact on the way the commander visualized the operational framework and applied the elements of operational design.

The operational framework described in the 1986 version of *FM 100-5, Operations,* also was not specifically defined. However, components of the current definition of operational framework, contained in the 2000 version of *ST 3-0, Operations* were present in the 1986 manual. The 1986 version contained a single component of the current definition of the operational framework-- battlefield organization. The battlefield organization was characterized as the area of operations (AO) and the area of interest (AI). AO and AI in the 1986 version were defined as the "specific zone or sector assigned to a commander" and the "area that might effect the friendly force throughout the duration of the operation in question," respectively.[15]

The graphics associated with these definitions, in the 1986 version of *FM 100-5, Operations,* clearly articulated the fundamental of the Airland Battle Doctrine, "a doctrine focused on the three dimensional nature of modern war."[16] Specifically, the 1986 version envisioned a contiguous AO. A contiguous AO defined as: "an AO were subordinate units share a common boundary." [17] The visualization of the contiguous AO lead to the description of operations in terms of close, deep, and rear spatial relationships. Close operations were those operations involved in the current fight. Deep operations were those operations directed against enemy forces, which would influence the conditions of future operations. Rear operations were those activities rearward of elements in contact.[18]

The operational environment envisioned in the 1986 version of *FM 100-5, Operations,* were geographically oriented, contiguous and with linear lines of operations. The Korean peninsula is a good current example of this construct. Though non-linear operations were mentioned in the manual, it was only in the context of the potential operations that would follow from the break-through of the main defensive belt of the enemy. Specifically, the 1986 version of *FM 100-5, Operations,* stated, "successful attack will require isolation of the battlefield in great depth as well as the defeat of enemy forces in deeply echeloned defensive areas."[19] Linear operations in a contiguous AO helped commanders direct and sustain combat power in concert with adjacent units.[20] This linear description of the operations occurring on a contiguous battlefield had useful application against the perceived threat of the 1980's—the Soviet Union; a threat that was relatively symmetric and arrayed in depth.

However, the new operational environment envisioned in *ST 3-0, Operations*, required a much broader view of the operational framework. The operational framework, in *ST 3-0, Operations,* was defined as "the arrangement of friendly forces and resources in time, space and purpose with respect to each other and the enemy or situation. It consists of the area of operations, battlespace and the

battlefield organization."[21] The definition of AO took on a more complex characterization of the environment. The AO was now characterized as both contiguous and non-contiguous. Non-contiguous AO was defined as: an AO where a subordinate unit AO does not share a common boundary with another subordinate unit. The higher headquarters retains responsibility for the unassigned portion of its AO."[22] The non-contiguous environment was, in part, a product of the increasing number of stability operations the U.S. Army found itself conducting.[23] The non-contiguous environment adds multiple layers of complexity and requirements to the decision-making necessary for this environment.

The separation of subordinate units in space and time within a higher headquarters AO increases the number of decisions and operational requirements of commanders. From the higher headquarters perspective, the synchronization of combat power, allocation of a limited number of assets, logistical support, convoy requirements and protection, and communications all are significantly more difficult to plan and execute in the non-contiguous environment. Additionally, the non-contiguous environment mandates requirements of the higher headquarters. The most important requirement deals with the unassigned portions of its AO. Though this requirement was not new, it is different in scope. Specifically, the headquarters now must provide some form of intelligence, surveillance or reconnaissance (ISR) to monitor the space surrounding a subordinate AO. The continued separation of subordinate forces clearly adds to the complexity of the problem for a higher headquarters. Though stability and support operations were most frequently associated with the non-contiguous environment, future offensive and defensive operations may also be conducted in the non-contiguous environment.[24]

ST 3-O, Operations, states, that non-contiguous AOs require situational understanding and precision fires.[25] Being a force projection Army may lead to the initial lack of situational understanding or precision fires—the necessities to operate in a non-contiguous AO. This shortfall may place the

commander's forces in a precarious position. Though *ST 3.0, Operations,* states that AOs are established by the higher headquarter commander, it is possible for the enemy to block ports, both air and sea and by so doing dictate a non-contiguous environment.[26] This situation may require the re-establishment of a contiguous AO, until various operational requirements have been met. Moreover, a variety of other conditions may suggest the establishment of a non-contiguous AO—like, an ill-defined enemy and a vast theater of operations. The establishment of a noncontiguous AO will dramatically increase the operational complexity and uncertainty for the commander.

The second element of the operational framework described in *ST 3-0, Operations,* was battlespace, defined as the environment, factors and conditions commanders must understand to successfully apply combat power, protect the force or complete the mission, accounts for several new factors of the operational environment. Battlespace consists of the commander's AO, areas of influence and interest, the information environment, force projection base, and home station.[27] Battlespace accounts for the increased complexity associated with displaced civilians, non-government organizations (NGO), facilities, weather, terrain, the electromagnetic spectrum and the information environment.[28]

The addition of battlespace to the operational framework highlights, at least conceptually, the dramatic changes between the operational environment of the 1980's and today. Specifically, the components of battlespace exemplify the shift from a tactical focus (1986 version of *FM 100-5 Operations*) to a more operational focus *(ST 3-0, Operations).* For instance, area of influence, defined as the geographic areas that the commander can influence by maneuver or fire support systems has increased dramatically over the last twenty years, as exemplified by the range increase in artillery munitions.[29] The increase in the ability to attack targets hundreds of kilometers away now presents tactical commanders with the possibility of generating operational impacts. Tactical defined as the

employment of units in close combat. Tactics also includes "the arrangement of and maneuver of friendly units in relation to each other, the terrain and the enemy to translate potential combat power in to victorious battle." Operational defined as the "level at which campaigns and major operations are conducted and sustained to accomplish strategic objectives within theaters or areas of operations."[30] The area of interest also highlights the increased time-compression associated with the current operational environment.

The area of interest, defined, as "the area of concern to the commander, including the area of influence and areas adjacent to it, is a potentially vast area. It extends into enemy territory, to the objectives of current or planned operations. This area also includes areas occupied by enemy forces that could jeopardize the accomplishment of the mission."[31] Previously, in the 1986 version of *FM 100-5, Operations*, area of interest accounted for everything that is currently defined, in *ST 3-0, Operations*, by the area of interest and the area of influence.[32] The key concept that emerges from this difference is that there are forces that the commander cannot directly influence, but have the potential to rapidly jeopardize the mission. For example a highly mobile enemy force with long-range insertion capability, (e.g. helicopter mobile), that is currently out of range of any weapon system the commander has under his control. This highlights the rapid time-compression associated with decision-making in the current operational environment.

The third element of the Operational framework, battlefield organization, defined as the allocation of forces in the AO by purpose—encompasses three categories of operations: decisive, shaping and sustaining.[33] Though *ST 3-0, Operations* acknowledges the applicability of deep, close and rear operations, the nature of the operational environment made these types of operations a subset of decisive, sustaining and shaping operations.[34] The three new types of operations no longer were tied to

a geographical reference. The shift in the way operations were envisioned highlights the dispersion, depth, and simultaneity of action that U.S. Army forces were conducting in the new environment. Along with the operational framework, the elements of operational design provided an additional lens with which to analyze the new operational environment.

The 1986 version of FM *100-5, Operations,* lists three elements of operational design: center of gravity, culminating point, and lines of operation.[35] Conversely, *ST 3-0, Operations*, identifies the elements of operational design as: end state and military conditions; center of gravity; decisive points and objectives; lines of operation, culminating point; operational reach, approach and pauses; simultaneous and sequential operations; linear and nonlinear operations; and tempo. Expanding the elements of operational design reflect the U.S. Army's shift from a tactical focus to an operational focus in order to address the characteristics of the new environment. End state, lines of operations, operational reach, simultaneous and sequential operations, linear and non-linear operations and tempo were all included in the elements of operational design to account for the characteristics of the current operational environment. A discussion of Linear and non-linear operations exemplify these characteristics.

Linear and non-linear operations have taken on a new application from that contained in the 1986 version of *FM 100-5, Operations. ST 3-0, Operations,* states that non-linear operations can occur at the initiation of hostilities, not as a follow-on type of operations, conducted after penetration of the defensive belt, as mentioned in the 1986 version.[36] A non-linear operation, regardless of the associated benefits, vastly increases the difficulty of operations. The genesis of the difficulty arises from the simultaneity of action directed as several objectives. As indicated by *ST 3-0, Operations*, "nonlinear operations typically focus on multiple decisive points, …nonlinear operations proceed along multiple

lines of operations—geographic, logical or both. Lines of communications often diverge from lines of operation, and sustaining operations may depend on combat service support moving with maneuver units or delivered by air."[37] Of critical importance is the notion of multiple decisive points. Previously doctrine stated that only one decisive point was attacked at a time.[38] Attacking multiple simultaneous decisive points with a finite number of assets significantly diminishes the ability of the commander to shape the battlefield for his subordinate commanders. The ability to shape the battlefield is diminished because the commander no longer focuses his assets on a single objective. Now the same number of assets must be used against multiple and unrelated targets. Moreover, non-linear operations in a non-contiguous environment only further expand the number of variables a decision-maker must contend with.

The new operational environment has changed profoundly since the fall of the bi-polar world. No longer is the threat clearly defined. Moreover the potential adversaries of the U.S. military have had the opportunity to witness the awesome combat power the U.S. military can develop given time. In order to negate this build-up of power potential enemies will attempt to deny APODs and SPODs to U.S. military forces, potentially forcing the U.S. military to fight in a non-contiguous area of operation, along non-linear lines of operation. All of these influences create immense complexity and uncertainty for the commanders of today and in the future. Moreover, decision-making must occur in a time-compressed environment. Finally, the doctrinal comparison established the shift since the fall of the Berlin Wall, that the U.S Army was focused at the Tactical level of war to the realization that the U.S. Army was operating at the Operational level of war. In order to accurately assess if the MDMP will inform the decision-making process in the new operational environment, a thorough understanding of decision-making theory must be established.

III. DECISION-MAKING THEORY

The foundations of military decision-making were rooted in the theory of decision-making. To analyze and subsequently discuss the ability of the MDMP to inform the decision-making process applicable to the current operational environment it is necessary to understand the theory of decision-making. Gary Klein's, *Sources of Power*, articulated the theoretical foundations of decision-making.[39]

Decision-making theory has evolved in the last few years from the rational choice strategy to the naturalistic decision-making strategy. An understanding of the rational choice strategy highlights the current foundations of the MDMP. An understanding of the rational choice strategy provides insights to the evolutionary steps that the MDMP needs to take to be a viable process in the current operational environment. In order to suggest the possible evolutionary steps of the current MDMP an analysis of the doctrine of MDMP and the functions of wargaming will follow the discussion of the foundations of decision-making strategy.

Current decision-making theory reflects the way various cognitive tools, which Klein refers to as sources of power, were used in the field.[40] The application of these sources of power was not in the sequential linear methodology of old decision-making theory. Klein called the new application of the theory of decision-making, the recognition-primed decision-making theory (RPD).[41] The RPD highlights the critical products that techniques, such as wargaming within the context of the MDMP, should produce. These products influenced by the operational environment form the evaluation criteria to assess the ability of the MDMP to inform decision-making in the current operational environment. In order to establish these criteria an understanding of the old and new theories must be analyzed.

There were two broad categories of decision-making theories, the classical decision making theory, known as the rational choice strategy, and the emerging theory, known as naturalistic decision theory,

identifies the way decision-makers naturally make decisions—a method that perhaps the MDMP should incorporate. Rational choice strategy contained five steps. The first step was the identification of the set of options. The second step was identifying the way of evaluating these options. The third step was to weight each evaluation dimension. The fourth step was the actual rating of the various course of action. Finally, the fifth step was picking the option with the best score. This process was very analytical and sequential; and in general form, mirrors the MDMP. The sources of power needed for this process were deductive logical thinking, analysis of probabilities and statistical methods. Klein found that these sources of power and the rational process simply did not describe the decision-making process observed in the field. [42]

Klein found, after studying the application of the rational choice strategy, that decision-makers did not use this method. First the rational choice strategy was inadequate for the current complex environment. This was because the rational choice strategy did not work well in the following conditions: great time pressure, low experience level, dynamic conditions and ill-defined goals—conditions frequently found in the current operational environment.[43] Second decision-makers did not compare courses of action like the rational choice strategy suggested. Klein found that the complex environment required additional sources of power to make adequate decisions.[44]

The new sources of power that Klein found broke the mold of the classical approach to decision-making. He stated, " yet the sources of power that are needed in natural settings are usually not analytical at all."[45] The sources needed for the naturalistic decision theory were intuition, mental simulation, metaphor and storytelling. Intuition involves the ability to size up the situation; much like the commander does, based on his experience, throughout the MDMP. Mental simulation allows the decision-maker to imagine how a course of action will play out, much like the mission analysis step of

the MDMP. Metaphor enables the decision-maker to apply past experiences against the current situation, much like a commander does during various briefings throughout the MDMP process. Storytelling helps allow the consolidation of our experiences to make them available in the future.[46] These sources of power were used to allow the decision-maker to choose a course of action through a process known as satisficing.

"Satisficing" was the term Klein used to describe the methodology observed in a variety people empowered to make decisions, e.g. fireman and tactical military commanders. Satisficing was simply selecting the first option that solved the problem.[47] This observation ran counter to the analytical methods contained in the rational choice strategy. Yet the data did not support the rational choice strategy. Klein notes, "again and again the message was repeated: careful analysis is good. Incomplete analysis is bad. And again and again the message was ignored; trainees listen dutifully, then go out of the class and act on the first option they think of."[48]

The first phenomenon that Klein attempted to answer was how decision-makers were able to reliably identify good options. This phenomenon of satisficing described how commanders were able to generate good options without comparison, as Klein states: "commanders simply did not have to refuse between choosing options, they simply did not have to choose."[49] The ability of experienced commanders to generate single options without comparison indicated a failure of the classical analytical approach to decision-making. However this failure only has application to experienced decision makers where recognizable patterns were present.

The classical analytical models were useful for inexperienced staffs guided by experienced commanders.[50] It is suggested at this junction that current U.S. Army Division and Corps commanders are now inexperienced decision-makers in the *current operational environment*. The mere fact that

no decision-making doctrine exists for this environment is offered as testimony to this deficiency in the force. Even though the classic analytical model is useful for inexperienced decision-makers it is not without its problems. Particularly, this model failed for experienced decision-makers for two reasons. "First the rigorous analytical approach cannot be used in most natural settings—because of time pressure, uncertainty and ill-defined goals. Second the recognition strategies that take advantage of experience were generally successful, not as a substitute for analytical methods, but as an improvement on them." Additionally, "the steps in the [classical analytical model] were reasonable. The problem with them was not in the steps of the model, but in the assumption of a linear thought process."[51]

The problem with the perceived linear thought process of the analytical models is that the process requires the decsion maker to complete each step before preceding to the next step in the process. An example of the problem with the adherence to a linear thought process within the classical analytical model, can be found at the first step of the process—define the goal. According to the classical model the problem or goal must first be accurately defined to precede to the COA development step in the process. Strict adherence to the process should prevent the decision-maker from proceeding to the next step if the problem cannot be defined.[52] As previously established, ill-defined problems and uncertainty abound in the current operational environment—hence the difficulty with the classical approach. This suggests that the process must be able to generate adequate *synthetic experience*, to overcome the paralysis associated with uncertainty and ill-defined goals. Klein also attempted to understand an additional phenomenon identified through observation—the lack of comparison.

Klein sought to account for how commanders evaluated an option without comparing the COA to any other option. As Klein stated, "even when faced with complex situations, the commanders could see [the problem] as familiar and know how to react."[53] The ability to generate reliable options without

comparison relied heavily on the decision-makers experience and intuition. The two phenomenon described by Klein were the basis of the naturalistic decision-making model that described the way decision-makers made decisions in the field. The melding of these two phenomena formed the RPD decision-making model

As Klein states, "the RPD fused two processes: the way decision-makers size up the situation to recognize which COA makes sense, and the way they evaluate the COA by imagining it."[54] The RPD model has been widely acknowledge for its accuracy across many fields as exemplified by an independent RAND study in 1989, "previous views suggested that experts solved problems by the application of general principles and deductive steps that provide casual links between stages in a problem solving sequence; in fact is quite rare…. Experts in most fields tend to solve problems and to make decisions by recognizing existing situations as instances of things with which they are familiar on the basis of their past experience."[55]

The applicability of the RPD has even been validated through Klein's research in the U.S. Army at the division and below.[56] Additionally, the time period of the evaluation cited in Klein's findings (early 1990's) would have corresponded to a period when the U.S. Army was still utilizing cold-war doctrine and still conducting exercises based on the cold war bi-polar environment. Klein observed multiple battle command teams and 96% of the decisions made fit the RPD model. Moreover, the RPD model accounted for decisions made by commanders and staff elements alike, as one account that Klein described,

> We went to Fort Hood, TX, to watch a command and control team at the Army Brigade level go through a training exercise. The decisions were going to be made by teams, not individuals, and we thought this might further reduce the rate of the RPD strategies. We got a complete record of one five-hour planning session. Twenty-seven distinct decision points were made during this period. Only one of those points showed

> evidence of comparing options-particularly surprising since Army planners are indoctrinated to generate a set of different options, usually three.[57]

Klein's observations validated that *experienced* decision-makers were able to deal with ill-defined goals and uncertainty. However, Klein's observations were conducted in a tactical Cold War environment—environments where the RPD worked because commanders had experience. In the operational environment the RPD might not be enough. This is not to suggest that the RPD has little value in the current environment—on the contrary. The RPD provides the critical insights of how commanders make decisions. These insights can be applied to the MDMP to make the decision-making process better suited for the current operational environment. In an effort to understand how decision-makers were able to make decisions, Klein found that decision-makers primarily used two sources of power—mental simulation and intuition.[58]

Mental simulation was defined as the ability to imagine people and objects consciously and to change those people and objects through several transitions, finally picturing them in a different way then at the start. In a military context, mental simulation imagines how a COA would be played out into the future. "Perhaps most importantly mental simulation can be used for predicting the future from the present."[59] However, mental simulations were not without their pitfalls.

There does exist a potential problem with reliance on developed mental simulations by which you evaluate a COA—simply the simulation may be inaccurate. The increasing complexities of the operational environment make the cognitive establishment of mental simulations increasingly difficult. "If the problem was linear…the job [of visualizing] was not too hard. If the variables interacted with each other the job of visualizing the [COA] in action became quite difficult."[60] Moreover, these complexities require the person constructing the mental simulation to have a lot of experience with the task and that

person to think at the right level. [61] The difficulties with establishing mental simulations in a complex environment suggest the importance of the commander and staff relationship. The staff, filled with specialists, can create the necessary mental models that deal with the wide range of complexities, thereby allowing the commander to focus on the general concept. Even though mental simulations have potential pitfalls, the generation of accurate mental simulations has great value for the current military problem set.

Mental simulation enables the commander and staff to project the future and recognize patterns or the lack there of. Additionally, mental simulation enables the decision-maker to modify the existing COA. As Klein stated, "once you have evaluated the action sequence, which is usually a planned COA, you may try to modify the plan to overcome the pitfalls; or you may decide it cannot be salvaged, so you reject it; or you may carry it out."[62] The power of mental simulations to help project the future should not be overlooked.

The construct of mental simulations enables the decision-maker to develop mental pictures of what the decision-maker intends to see in the future, thus enabling the decision-maker to forecast the future—much like the images that wargaming enemy COAs can do for the commander and staff. These expected images could either be confirmed through what does happen or what does not happen. Mental simulations serve several additional key functions in non-routine decision-making. First, mental simulations help to explain fragmented bits of information so that we can figure out how to interpret a situation. Second, mental simulations help generate expectancies by providing a preview of events—much like wargaming. Third, mental simulations enable the decision-maker to develop COA against the expectancies. Finally, mental simulations enable decision-makers to evaluate a given COA.[63]

Mental simulation occurs within the RPD model in three places. First, mental simulation occurs to establish situational awareness, similar to the mission analysis step of the MDMP. Second, mental simulation occurs during the generating expectancies to help verify situational awareness, much like in COA development step of the MDMP, and finally mental simulation occurs during the evaluation of a COA, much like in COA analysis step of the MDMP.[64] If mental simulation was viewed within the context of wargaming, the naturalistic decision-making theory suggests that perhaps wargaming be an iterative process conducted throughout the MDMP process. The occurrence of mental simulation in various stages of the RPD suggests that a similar process, specifically wargaming within the MDMP, might also occur in various stages—a concept to be explored further later.

Inextricably linked to mental simulations was the concept of shared vision. Shared vision between the commander and staff has profound implications for the conceptual wargaming process and the mental models used in that process. A RAND study, *Understanding Commanders' Information Needs*, which looked at decision-making at the Brigade level and above, stated, "it is important, that the commander's and staff's images or models, although idiosyncratic, have a great deal of overlap and that shared image be a congruent with reality as possible. This shared image must remain central even as it is continually refined and verified."[65] The interdependency of mental images and shared vision affect the way the MDMP and ultimately wargaming must be understood.

The RAND study suggested that commanders typically have already made a decision about the COA prior to the decision brief.[66] Moreover, the MDMP was more about the creation of a shared vision between the commander and the staff, than a method by which to decide the MDMP was the vehicle by which the image was converted into action.[67] Additionally, the study notes that information between the commander and staff pass along a variety means. The means of transmission are

dependant upon the shared mental image between the commander and the staff. The complexity of the battlespace, volume of information and the shear number of systems to manage make it impossible for the commander to personally control the action of all the systems, much less process all the available information. The staff must perform this function for the commander. In order to accurately perform this function for the commander a shared vision must be established between the commander and the staff. It is through this shared vision that the staff understands when the commander's mental models have been violated. This violation of the mental model generates the transmission of information to the commander.[68] The notion of shared vision cannot be underestimated and must underpin the outcomes of wargaming—simply stated a shared vision between the commander and the staff must occur during wargaming.

The other source of power critical to how decision-makers make decisions was intuition. Intuition relies on the use of experience to recognize key patterns that indicate the dynamics of the situation—thus intuition was directly proportional to experience. Intuition plays a critical role in pattern recognition that mental simulations help to create. A derivative of experience, intuition, enables the decision-maker to see "patterns, anomalies and other violations of expectancies, big picture, the way things work, opportunities, improvisations, future events and differences too small for novices to notice."[69] Moreover, the accuracy of intuition was quite reliable. Intuition of an experienced decision maker has shown to produce fairly accurate solution sets for a given problem. However, decisions produced by intuition offer two broad characteristics. On the one hand intuition yielded a decision that was not precise, but about right. On the other hand intuition yielded a decision that had a fairly low error frequency rate. Henry Mintzberg, a fellow from the Royal Society of Canada, supports this notion in his book, *The Rise and Fall of Strategic Planning.* He writes, "intuition, in contrast, was less frequently

precise but more consistently close. In other words, informally, people get certain kinds of problems more or less right, while formally [using analytic problem solving methods], their errors, however infrequent, can be bizarre."[70]

In spite of the overwhelming evidence that Klein provides for the validity of the RPD model, it does not account for the full spectrum of conditions in the operational environment. Klein suggests that the spectrum of options in the operational environment is bounded by two extremes. On one extreme, where the RPD works, the characteristics of the environment are: great time pressure, high experience level, dynamic conditions and ill-defined goals. The characteristics of the other extreme, where the classical analytic model works, are: need for justification (low experience level), conflict resolution (definable goal), optimization (best COA to achieve that goal), and greater computational complexity (problem has to many components to easily identify the problem).[71] However, this spectrum assumes that all the characteristics associated with either extreme are directly related and proportional to one another. For example, high experience level only occurs when there is great time pressure, dynamic conditions and ill-defined goals. This spectrum, as defined by Klein does not account for the condition of low experience, great time pressure, dynamic conditions and ill-defined goals. The failure of Klein's model to account for this condition does not negate the applicability of the RPD. Instead, the failure suggests an evolution of the current decision-making process to account for this unforeseen condition.

The naturalistic theory of decision-making embodied in the RPD accurately reflects the way decision-makers solve problems when there is great time pressure, high experience level, dynamic conditions and ill-defined goals. The RPD highlights the importance that experience plays in the process. Moreover, the RPD establishes the critical link that mental simulations, intuition, shared vision, and pattern recognition interacts within the construct of decision-making. However, the potential problem with the

RPD, at least in a military context, was the very quality the RPD needs to effectively operate—experience. As Mintzberg states, "one cannot be effectively intuitive unless one has intimate knowledge of the subject in question, which sometimes requires years to develop. Good analysis, in contrast, is available anywhere clever analysts can get their hands on good hard data."[72]

The RPD suggests that the critical ingredient to decision-making is experience. However since the collapse of the bi-polar world and the emergence of the new operational environment, there is no guarantee decision-makers will have appropriate experience. The answer to this paradox lies in the way the MDMP is viewed and executed.

IV. MILITARY DECISION MAKING PROCESS

The military decision making process (MDMP), as the name implied, is the U.S. Army's methodology for tactical decision-making. MDMP, contained in the 1997 version of *FM 101-5, Staff Organizations and Operations,* is an analytical model of planning. This planning model was based on the conventional theory of decision-making, which views decision-making as the systematic process of analyzing and comparing multiple options against one another to arrive at the optimal solution. As stated in *ST 6-0, Command and Control,*

> The analytic approach aims to produce the optimal solution to a problem from among those solutions identified and emphasizes analytic reasoning processes guided by experience. It is methodical, and it serves well for decision-making in complex or unfamiliar situations, allowing the breakdown of tasks into recognizable elements. It ensures that the commander considers, analyses, and evaluates all relevant factors. It provides a methodology when the decision requires great computational effort. It provides good context for decisions, especially for explanations. It helps resolve conflicts among courses of action when such exist. Finally, it serves inexperienced personnel by giving them a methodology to replace the experience. It is time-consuming and is not appropriate for all situations. The Army's analytical approach is the MDMP.[73]

The above statement espouses several critical aspects of the MDMP. Specifically, the MDMP is potentially time consuming, fills experience voids, and serves well in complex or unfamiliar situations. The importance of this is related to the current operational environment for three reasons. First the current operational environment is one of time compression, which suggests that the MDMP must be responsive to this time compression to be an effective decision-making model. Second, the experience level of U.S. Army staffs and their associated commanders in the current operational environment is low. Therefore the MDMP, if done correctly, can help to fill that experience void. Third, the mere fact that the MDMP is suitable for complex environments identifies its applicability to the current operational environment. The MDMP follows a logical sequence of steps.

The MDMP is comprised of six major steps. The steps of the MDMP are: receipt of mission, mission analysis, COA development, COA analysis, COA comparison, and COA approval and orders production. The MDMP begins with the receipt of mission. The purpose of this step is for the commander and staff to do a quick initial assessment. The initial assessment determines: the time available until execution of the mission, determines the time available to plan, and begins the initial intelligence preparation of the battlefield. This step is also designed to initiate parallel planning with subordinate staffs, through the issuance of a warning order to that subordinate element.[74]

The next phase of the MDMP is mission analysis. The purpose of this step is to analyze orders, guidance and other information provided by higher headquarters in order to produce a unit mission statement and receive commander's planning guidance. This step also includes the determination of specified, implied and essential tasks, conduct of the initial intelligence preparation of the battlefield (IPB) and determination of critical facts and assumptions and information requirements. In total, this step contains seventeen sub-steps that are required to complete mission analysis. This suggests that the

performance of all sub-steps within mission analysis must at least be considered for that steps utility. Moreover, the environment of uncertainty and ill-defined goals, as exists today, may require each step in mission analysis to be performed--for the simple reason that decision-makers in this environment simply do not know what they do not know. The products of mission analysis include the restated mission, commander's intent and guidance, establishment of the battlefield framework, warning order and preliminary movement of subordinate units. Additionally, this step drives the rest of the planning guidance. A poorly done mission analysis frustrates the entire MDMP.[75] Additionally, a poor mission analysis prevents the most critical function of mission analysis from occurring—a critical function rarely realized by those utilizing the MDMP—visualization.[76]

Visualization was a mental process by which a commander cognitively can see the enemy, the end state of the battle and future events. Commander's visualization is defined by *ST 6-0, Command and Control as:*

> The process of achieving a clear understanding of the force's current state with relation to the enemy and environment, developing a desired end state which represents mission accomplishment, and determining the sequence of activity that moves the force from its current state to the end state.[77]

Carl Von Clausewitz in *On War,* claims that the ability of the commander to visualize was one of two qualities that a commander must possess if the commander was to "emerge unscathed from the relentless struggle with the unforeseen."[78] The French word that Clausewitz used to describe the visualization by the commander was *Coup d'oeil.* Clausewitz further defined the importance of this visualization, by stating, "c*oup* d'oeil therefore refers not alone to the physical but, more commonly, to the inward eye. The expression, like the quality itself, has place in strategy…. Stripped of metaphor…the concept merely refers to the quick recognition of a truth that the mind would ordinarily

miss or would perceive only after long study and reflection."[79] Mission analysis is the apparatus that assisted the commander in the visualization of the desired outcome.

Characteristics of the new operational environment, described earlier, like "increasing technology advancements, the fluid nature of operations and the volume of information increase the importance of commanders being able to visualize and describe operations."[80] This suggests that with the increasing importance of visualization, so goes the importance of mission analysis. Additionally, visualization increases in importance as the level of commander increases. In other words the increasing importance of visualization is directly proportional to higher echelons of command.[81] Visualization gains critical importance at the operational level. As stated in *ST 3-0, Operations*,

> Operational art differs from tactics principally in the scope and scale of what commanders visualize, describe and direct. Operational commanders identify the time, space, resources, purpose and the action of land operations and relate them to the joint force commander's (JFC) operational design…. While JFCs and component commanders exercise leadership primarily through subordinates, small unit commanders command face to face. Operational success depends on the ability of operational commanders to visualize and describe complex land operations; tactical success depends on the ability of small unit commanders to motivate and direct soldiers.[82]

Joint Publication (JP) 5-00.1, *JTTP for Joint Campaign Planning*, also supports the importance of visualization and how wargaming assists that visualization. In a discussion of wargaming techniques JP 5-00.1 states, "All previous steps prepare the staff for conducting the wargame assessment, which requires the staff to visualize every phase of the campaign plan from force projection to termination."[83] In sum, the higher the level of command the more the commander depends on the information, and perhaps more importantly the visualization, created from his staff and subordinate commanders and less from his own observations.[84]

This inherent reliance by an operational commander on the creation of visualization can cause multiple problems. The first problem stems from the difference in the visualization that takes place through personal experience versus through a second-hand source. For example, different experience levels will affect how a given individual assesses a particular situation. The novice will simply miss the peculiarities and patterns that an experienced observer would grasp immediately. General McArthur's visualization of the Inchon landing during the Korean War and the effects that landing would ultimately have is offered as a perfect example of the difference in visualization between the expert and the novice.

The next problem with the dependency of the commander on visualization is related to the first. Not only will the staff miss peculiarities and patterns, they will not be able to relay 100% of their experience to the commander. Creating a void in the desired goal of a shared vision. This problem exists because it simply is not possible to describe verbally the impact of simultaneous events. Verbal communication is simply limited to a linear development of a situation. Conversely, the visual experience synthesized a multitude of events simultaneously. Finally, as the information was transfused through various levels of command there were inherent distortion and delays in the information needed to create the visualization. A good example of this is the critical piece of information that the commander needs to make a decision. Yet the inexperienced observer unknowingly disregards the observed critical piece of information and does not transmit the observation to higher.[85] The sum of these problems demonstrates the need for a thorough mission analysis that creates an accurate visualization for the commander.

However, a good mission analysis also has a second order effect. A good mission analysis enables the staff and commander to visualize what the terrain will and will not allow, the realm of possibilities that the enemy and what options are available to the friendly commander—in effect create situational awareness and a shared mental model. A mental model is the model that a commander cognitively

generates through visualization.[86] The mission analysis process provides the forum for the commander and staff to share the mental model.

Clausewitz believed in the power of generating situational awareness and mental models. Clausewitz believed that a commander had to have determination in order to "follow the faint light wherever it may lead."[87] The role of determination is to limit the agonies of doubt and the perils of hesitation when the motives for action are inadequate. According to Clausewitz, determination was not a quality that came from superior intellect. Determination came from a mental act and was needed during periods of uncertainty—in effect determination came from long study, Clausewitz states,

> More is required to create determination than a mere conjunction of superior insight with the appropriate emotions. Some may bring the keenest brains to the most formidable problems and may possess the courage to accept serious responsibilities; but when faced with a difficult situation they still find themselves unable to reach a decision…. Conscious of the need to be decisive, they also recognize the risks entailed by a wrong decision; since they are unfamiliar with the problems now facing them, their mind loses its former incisiveness.[88]

Determination to Clausewitz was a mental model generated through the cognitive process that freed the commander from paralysis generated from an uncertain environment. The RPD also relies on shared mental models. As indicated earlier, the RPD model stated that this shared mental model was critical to the decision-making process. It was through this shared mental model that staffs could understand when the commander's mental model was violated. As stated in *ST 6-0, Command and Control,* "A [commanders] analyze or receive the staff's analysis of the mission, [commanders] develop a mental image of the friendly forces in relation to the enemy and the environment, and possible future operations at the conclusion of the operation or the end state."[89] Not only does a good mission analysis create visualization and a shared mental model, it must also provide the needed situational understanding in

order to proceed to the next step in the process. With the completion of mission analysis, the next step in the MDMP is COA development.

Taking the commander's guidance and restated mission the staff begins the next step in the MDMP--course of action (COA) development. The purpose of this step of the MDMP was that the staff generated several COAs for the commander's consideration. However, doctrine does not establish a requirement for the number of COA's needed. Doctrine states, "in a totally unconstrained environment, the goal is to develop several such [suitable] COAs".[90] COA development has six sub-steps. These steps include analyzing combat power, generating options, array initial forces, development of scheme of maneuver, assigning headquarters and preparing COA statements and sketches.[91]

The visualization and mental models created during mission analysis provide the framework for developing options in various COAs. The process was portrayed in doctrine as a very analytical, linear process. However a close study of that very doctrine reveals a very subjective, non-linear process. The various feedbacks required from various staff elements clearly demonstrated that COA development was a non-linear process. Moreover, it should be noted and critical to understand, that in practice and doctrinally, the commander rarely participates in this process. While the staff was developing situational awareness and generating their own mental models, the commander was also doing the same thing by a different means. The commander utilizes his subordinate commanders, moves about the soldiers and looks at the terrain. This scheduled separation of staff and commander is both good and necessary for the process to work effectively. First, the free play of the commander brings allows other ideas and information to enter the process. Second, the separation prevents the process from becoming corrupted by heavy-handed commander. The commander typically was reintroduced to the process at the completion of this step to make a decision on the COA statement and sketch.[92]

The next step in the MDMP was COA analysis. This step was designed to analyze the various COAs for the sole purpose of comparing the COAs in the subsequent step of the MDMP. The technique prescribed by doctrine to conduct the analysis was wargaming. Wargaming, as described in *FM 101-5, Staff Organizations and Operations*

> is a disciplined process, with rules and steps that attempts to visualize the flow of a battle. The process considers friendly dispositions, strengths, and weaknesses; enemy assets and probable COAs; and characteristics of the area of operations. It relies heavily on a doctrinal foundation, tactical judgment and experience. It focuses the staff's attention on each phase of the operation in a logical sequence. It is an iterative process of action, reaction and counteraction. Wargaming stimulates ideas and provides insights that might not other wise be discovered. It highlights critical tasks and provides familiarity with tactical possibilities otherwise difficult to achieve. Wargaming is the most valuable step during COA analysis and comparison and should be allocated more time than any other step.[93]

The doctrinal assessment of wargaming, above, reveals perhaps one of the biggest pitfalls of the current way the U.S. Army staffs' wargame. Wargaming, as described above, places a heavy reliance on judgment and experience. Yet, the most experienced member of the unit, the commander, usually does not participate in the wargame.[94] The commander's experience, as noted previously, is problematic in the new operational environment. Moreover the commanders experience is also not detailed in certain areas, like communications, fire support and combat service support to name a few. However, wargaming does provide discovery and establishes synthetic experience—two critical voids in the U.S. Army today. Wargaming is defined doctrinally as merely a technique by which to conduct analysis with the purpose of comparing COAs. However, in practice wargaming can possess far greater utility.

No better proof can be offered of the potential utility of wargaming than the doctrinal manual that contains the material on wargaming. *FM 101-5, Staff Organizations and Operations*, indicated the critical importance of wargaming. *FM 101-5,* states,

> Wargaming helps the commander and his staff to: Determine how to maximize combat power against the enemy while protecting the friendly forces and minimizing collateral damage. *Have as near an identical vision of the battle as possible*. Anticipate battlefield events. Determine conditions and resources required for success. Determine when and where to apply the force's capabilities. Focus IPB on enemy strengths, weaknesses, and center of gravity, desired end state, and decisive points. Identify the coordinate requirements to produce synchronized results. Determine the most flexible course of action.[95]

Despite the subservient doctrinal role of a tool of analysis, wargaming does much more than just analyze a COA, as the statement above indicates. John Schmitt, a distinguished author of the *Marine Corps Gazette*, in his article "How We Plan," also realized the vast importance of wargaming.[96] "The wargaming process actually underlies much of the earlier stages of planning, all the way back to understanding/conceptualize…. Wargaming may not necessarily be a separate phase…. We observed another key function of wargaming, which we had not anticipated. The wargame is an excellent learning opportunity." Schmitt also goes on to argue that wargaming a single COA against several enemy COAs will help planners and executors to better understand the uncertainty that they will face.[97]

Wargaming is comprised of eight steps. A review of the first five steps of the wargaming process arguably occurs during mission analysis and COA development.[98] A review of the desired outcomes of wargaming indicated that wargaming is much more than a technique by which to conduct analysis of chosen COAs. Arguably, all of the desired outcomes of wargaming (see previous footnote), except, perhaps, "determine the most flexible course of action," have absolutely nothing to do with analyzing a COA; but have everything to do with developing mental models, creating a shared vision between the commander and staff, predicting the future, and synchronizing elements of combat power. It will be argued that wargaming can also be used to provide an experience base when the commander finds himself in a position where he has little experience.

The author set out to determine if the current tactical decision-making process informs decision-making in the current operational environment? There were three criteria used to answer the question, they are: the ability of the MDMP to function in a time-compressed environment, the ability of the MDMP to fill experience voids, and the ability to establish shared mental models between the commander and staff. The MDMP did not achieve all the requirements of the evaluation criteria. First, The MDMP's requirement to generate several COA and perform the necessary analysis and comparison is time consuming. Second, the MDMP does fill experience voids, however it is dependant on experience from the commander, which is problematic in the current operational environment. Third, the MDMP does assist in the development of mental models. However, the development of a shared model is degraded by the necessity to generate several COA. The current MDMP does not produce a chosen COA until the end of the process; this makes it difficult at best to have a shared vision between the commander and staff. The overall assessment of the MDMP is that it partially informs the decision-making process in the current operational environment. What is needed is a logical evolution of the tactical MDMP into a form capable for the current operational environment.

V. LOGICAL EVOLUTION OF THE TACTICAL MDMP

The fundamental dilemmas of decision-making within the U.S. Army are five fold. First, there currently is little experience within the U.S. Army at the operational level. Yet, since the end of the cold war the U.S. Army is increasingly becoming involved at the operational level of war, as the shift in focus of the Army's doctrine indicates. Second, Joint Doctrine does not prescribe a methodology for decision-making that is fundamentally different from the tactical MDMP contained in U.S. Army doctrine. Because of the deficiency in Joint Doctrine it is logical that a U.S. Army planner, for example, operating in a Joint Task Force (JTF) Headquarters will utilize the only decision-making process that the

planner is familiar with—the MDMP. Yet the MDMP is a tactical process. Third, the MDMP was a tactical decision-making process designed for the pre-cold war, tactical U.S. Army. However, the post-Cold War environment is more focused on the operational level. Fourth the MDMP was potentially time-consuming, yet functioned-well in complex and uncertain environments. Yet, the current environment mandates a decision-making process that operates in a time-compressed environment. Finally, the MDMP, along with all analytic methods of decision-making, did not accurately model the way experienced decision makers naturally made decisions. Yet, decision-makers typically use their experience to develop single COA that will correct the problem

Moreover the theories of decision-making state that when the experience level is high, relative time pressure is high, and uncertainty is high that the RPD model best describes the manner in which decision-makers decide. However, the model that describes which decision-making method (rational or recognitional) had better applicability, given a set of circumstances, does not account for all possibilities within the continuum of decision-making. Specifically, the continuum does not account for the instance were experience was low, staff experience was low, relative time high, and uncertainty high—interestingly enough a mark on the continuum that replicates a U.S. Army Corps operating as a JTF HQ's during a crisis.

So what construct should a commander and planner use to make effective decisions? The answer lies in the way the MDMP is applied, coupled with the need for experience, as expressed by the RPD. Generally speaking, the evolved MDMP needs to function in a time-compressed environment. Second, the MDMP must fill the experience voids of the staff and the commander—in effect provide synthetic experience. Third, the MDMP must foster shared mental models between the commander and the staff.

Enabling the MDMP to function in a time-compressed environment is a relatively easy task. The apparent solution is to generate only one COA. Currently the MDMP suggests that several COAs be developed, analyzed and compared with the end result being the selection of the optimal solution. This greatly increases the time required to complete the process. Moreover it is arguable whether or not the process really generates an optimal solution. Certainly, given an opponent that is one hundred percent predictable, commanders and staffs could generate an optimal solution. But this is not the case; opponents of the U.S. Army have always been freethinking with plans and intentions that were not known. Accepting this fact leads to the conclusion that a single COA that is flexible enough to cover a continuum of enemy COAs over a COA that is optimal for only one enemy COA, would be preferred. Additionally, the RPD model has shown that experienced commanders do not consider multiple COAs; so why force them to do so?

An experienced commander mentally generates one COA that will satisfy the assigned mission, and he does this prior to the COA development phase of the MDMP—which means the commander has mentally selected a COA by the conclusion of mission analysis (a discussion on generating experience will follow, but for now assume the commander has the requisite experience needed to generate a COA that satisfies the units mission). The commander should at this time direct the COA for further development and eliminate the development of multiple COA's. Not only does the selection of one COA save time but also enhances the mutually shared visualization between the commander and the staff.

The ability for the commander and staff to share a vision of the action taken by friendly forces can be greatly improved through the selection of one COA early in the MDMP process. By doing so the commander and staff are focused on the same COA throughout the entire process. This is not to

suggest that a COA be chosen and not changed during the process. What is being suggested is that a COA be chosen early in the process and refined throughout the MDMP. Currently, multiple COAs are discussed in relative detail. It is not until the final step in the MDMP that the COA selected. It is suggested that the difficulty the U.S. Army has synchronizing its systems is directly related to the lack of shared visualization that needs to be created early in the MDMP. Additionally, the advantage of selecting a single COA early in the process is that the commander and staff do not have to complete the entire MDMP. Stopping the MDMP process before its completion is certainly not the preferred solution to utilizing the MDMP. Currently the MDMP does not provide a useable COA until the end of the process—in effect you must complete the entire process to get a viable COA. Selection of a COA early in the process solves this dilemma. There is also a second order effect generated by the early selection of a COA. Early selection of the COA means that subordinate units will have more time to plan and synchronize a detailed plan that supports the chosen COA. In effect they will be able to choose the COA that supports the higher headquarters mission statement and begin collaborative parallel planning which facilitates a more synchronized cohesive plan. Finally, the early selection of a COA allows for the continual refinement of that COA and enhances a shared visualization between the commander and staff.

Klein's view of mental simulations and their role in decision-making coupled with where mental simulation occurs in the RPD and the ability of wargaming to generate experience, offers a means to generate experience and establish a shared common vision between the commander and staff. Mental simulations occur to first, establish situational awareness, second, to generate expectancies and finally, to evaluate a COA. Laying this construct over the MDMP suggests that wargaming be utilized differently.

Generating experience and a shared vision can occur during the course of the MDMP by applying the analysis technique of the MDMP—wargaming—in a different manner. In other words wargaming is the mental simulation and therefore should occur when situational awareness, generation of expectancies and COA evaluation occurs. Specifically, wargaming occurs during mission analysis, COA development, and COA analysis.

A good mission analysis is absolutely fundamental and vital to the successful development of a COA. Situational awareness and the development of experience must occur during this step if a feasible, acceptable and suitable COA is to be developed in the subsequent step. So how can wargaming assist in this effort? First, wargaming can assist in the development of the mental visualization of the area of operations along with its associated impacts. Second, the *staff*, not just the G2, should develop potential enemy COAs through wargaming. Finally wargaming can create the realm of possibilities for friendly force application.

During mission analysis individual staff elements still need to conduct the steps proposed in *FM 101-5, Staff Organizations and Operations*. However, much of it can be accomplished while initiating the wargaming process. For example the map of the AO needs to be established with all available forces displaced on the map. At this point the staff should begin a detailed map analysis, which is the beginning of the intelligence preparation of the battlefield. This subtle point here is that the *staff* collaboratively conducts an analysis of the AO. But this analysis is much more than just identifying avenues of approach, and restricted terrain. The staff needs to understand the full impacts of the terrain. In effect visualize what the terrain will and will not allow. For example, bridge weights, slope of terrain, slope of banks along rivers, are frequently not analyzed. It simply is impossible to identify the realm of possible

enemy COAs without a full understanding and visualization by the staff on the limitations and restrictions of the terrain.

The creation of synthetic experience through recognizable patterns can be generated by wargaming, as a staff, the potential enemy COAs. Currently the G2 generates the most likely and most dangerous enemy COA. Subsequently the G2 briefs these COA's to the rest of the staff. It is more than intriguing that a group of individuals, from the G2 staff, a staff with no individual combat arms experience suddenly is entrusted with developing the possible enemy COAs by which the friendly COAs are based. This is not to suggest that the G2 is not intelligent, on the contrary. Merely, the G2 lacks the experience to accurately develop a group of enemy COAs. What is needed is a collaborative effort from the entire staff, utilizing the collective staffs experience. This process can best be done through wargaming. With the established staff visualization of the AO and a full understanding of its effects, the staff can collectively explore the realm of possible enemy course of action. Using wargaming to develop enemy course of action creates a shared enemy mental model for the entire staff, not just the G2. Moreover, developing enemy COAs through wargaming establish recognizable patterns associated with the various COAs. The patterns enable the staff to validated or invalidate enemy COAs during execution. The desire to create mental models means that the staff must endeavor to create a visualized enemy capability. For example, to portray an axis of advance of a particular echelon of an enemy maneuver unit does little for the shared visualization. But if the staff integrates how fast the enemy can actually move over time, a shared visualization is created. Finally, developing the potential enemy COAs through wargaming helps the staff to gain an appreciation of the level of uncertainty. Though not initially comforting, it is critical to understand what you do not know instead of wishing away-unforeseen events.

Very similar to the development of enemy COAs is the establishment of friendly force capabilities. The shared visualization of friendly force capabilities is very similar to the development of the enemy COAs. More must be done during mission analysis than locating friendly units in the AO. Visualization of the combined staff estimates can be established through wargaming the realm of friendly possibilities. Armed with the knowledge of the terrain and potential enemy COAs, the staff will better understand the key tasks that need to be accomplished and the key terrain that must be controlled in order to support the higher headquarters commander's intent. If the staff desires to get good commander's guidance, the shared mental models of the terrain, enemy COAs and friendly force capabilities, that the staff shares, must be articulated to the commander in the mission analysis briefing. Moreover the generated experience (synthetic experience) gained through wargaming during the mission analysis process will make the required products of mission analysis more salient and applicable to the following step in the MDMP—COA development.

The current MDMP requires that the COA developed be feasible, suitable, acceptable, different and complete (subsequently referred to as the FAS-C test). It is interesting to consider how a planner develops such a COA without wargaming that COA against various possible enemy COAs? It is suggested by this author that you cannot. Assuming that a thorough mission analysis has been conducted, the key tasks that must be achieved should be fairly apparent. As stated earlier, decision-makers armed with experience, in this case, experience generated during mission analysis, intuitively know which COA will generally work. With the establishment of a COA, it becomes the role of wargaming to ensure that the developed COA passes the FAS-C test. In order to establish passing the FAS-C test, the wargame during COA development will replicate the action/counter-action/reaction wargame formally conducted during the COA analysis step of the MDMP with one modification.

Currently, the enemy force is always given the first action. It is suggested that based on mission analysis, the force with the determined operational initiative should get the first action of the wargame. Outcomes of this wargame include further refinement of the COA, enhanced situational awareness, and improved patterns of recognition, developed from enemy counteractions during the wargaming process. Additionally, the COA development phase also produces a warning order to the subordinate headquarters—three steps earlier than in the original MDMP. The next step is COA analysis.

COA analysis is no longer needed in a *time-constrained* environment, since only one COA is developed. Further, why does a COA need to be analyzed if it passes the FAS test? What the COA does need is refinement. The COA analysis step of the MDMP should evolve into a COA refinement as the logical step following COA development. Again wargaming can assist with this refinement. This wargaming becomes more of a synchronization/rehearsal for the staff and the *commander*. The inclusion of the commander during this wargame enables the complete shared mental model to develop between the commander and the staff. Moreover this enables the commander to share the patterns he is looking for during the course of the wargame. The remaining steps of the MDMP are really only applicable if time is not a factor. The process of selecting of multiple COAs, analyzing, comparing and selecting the optimal COA is to time intensive and frustrates the creation of a shared mental model.

VI. Conclusion

This author set out to determine if the MDMP informed the decision-maker in the current operational environment. In short the MDMP does not achieve this desired result. However, the problem does not lie with the MDMP itself. The problem lies with the way the MDMP is viewed in doctrine and in practice. Doctrinally and in practice the MDMP is viewed as a linear decision-making process that is reliant on the experience of the commander. The MDMP when *viewed correctly* is a superb process

for the current operational environment. Specifically, the MDMP, both doctrinally and in practice must be viewed as a non-linear process (a process requiring feedback and refinement) that develops experience for the commander and the staff.

The MDMP needs to overcome three primary deficiencies to be functional in the current operational environment. First, the MDMP must operate in a time-constrained environment. This can be resolved with the elimination to generate several COA. Second, the MDMP must generate experience during the course of the entire MDMP. This experience based can be generated by involving all of the staff in some of the key steps of the mission analysis portion of the MDMP. Specifically, the staff must jointly develop situational awareness with regard to the terrain and enemy COAs and friendly force capabilities. Third the MDMP must promote a shared mental model. The application of an iterative wargaming process during mission analysis, COA development and COA refinement, along with the inclusion of the commander in the COA refinement step, will facilitate the needed shared mental model needed between the staff and commander.

Finally, the current *FM 101-5, Staff Organizations and Operations,* is currently under revision. In order for the new manual to have application in the new operational environment, the MDMP process needs to be rewritten to account for the way decision-makers decide, as expressed by the RPD model, the operational environment the U.S. Army finds itself currently operating in, and the need for experience development during the process.

ENDNOTES

[1]Robin Swan, *The Pieces of a Military Chessboard – What is the Contemporary Significance of Jomini's Design of a Theater of Operations*?, (School of Advanced Military Studies, United States Command and General Staff College, Fort Leavenworth, KS, 1990), 30.
[2] Department of the Army, *Student Text (ST) 6-0, Command and Control,* (Fort Leavenworth, KS, 31 August 2000), 4-1 – 6-20. *ST 6-0* is emerging doctrine. *ST 6-0,* along with *ST 5-0, Planning* will replace *FM 101-5*.
[3] Gary Klein, *Sources of Power,* (Cambridge, Massachusetts, MIT Press, 1999).
[4] *ST 6-0 Command and Control,* 2-16.
[5] Bi-polar world refers to a world that was created during the Cold War. The world was basically divided into two camps. In effect a country was either backing the United States and the western world or it was backing the Soviet Union and the Communist Block countries. After the collapse of the Soviet Union the world effectively became a multi-polar world where many regional nation states emerged as regional power brokers. It is widely accepted that the United States was the only remaining superpower after the fall of the Soviet Union.
[6]Headquarters, Department of the Army, *Army Posture Statement for FY01*, (Headquarters, Department of the Army: U.S. Government Printing Office, Feb 99), 3,6,8**.** A review of the military operations that involved the United States Army during the 1990's would include Panama invasion, Haiti, support operations in Florida, Somalia, Bosnia, Kosovo. This list is not inclusive, but gives the flavor of the vast number of operations the U.S. Army has participated in since the collapse of the Soviet Union.
[7] During my year at School of Advanced Military Studies, several briefings on *ST 3-0, Operations,* advertised the sheer magnitude of the new manual that encompassed the new shape of Army operations.
[8]*ST 3-0, Operations,* 1-7, 4-18, 5-6.
[9]Department of the Army, *FM 100-5, Operations,* (Washington, D.C. U.S. Government Printing Office, 5 May 1986), 6-7.
[10] Ibid., 6-3 – 6-9.
[11] Ibid., 9-4.
[12] The 1986 version of *FM 100-5, Operations,* chapters one and five are concerned with the moral and physical dimensions of the operational environment. Moreover, these dimensions were formally defined in the 1993 version of *FM 100-5, Operations*, Headquarters, Department of the Army (Fort Leavenworth, KS, 1993), 14-1. The moral dimension is the human dimension. The physical dimension is comprised of material and technology.
[13] *FM 100-5, Operations,*(1986), 2.
[14] *ST 3-0, Operations,* 1-7.
[15] *FM 100-5, Operations,* (1986), 3-5.
[16] Ibid., 9.
[17] *ST 3-0,Operations* 4-19.
[18] *FM 100-5, Operations,* (1986), 18.
[19] Ibid., 4.
[20] *ST 3-0, Operations,* 5-12.
[21] Ibid., 4-18.
[22] Ibid., 4-20.
[23] Ibid., 9-4.
[24] Ibid., 9-4. Stability and support operations are cited as the types of operations where non-contiguous areas of operations exist. Little credit is given to the possibility of this type of AO existing during offensive or defensive operations.
[25] Ibid., 5-11 – 5-12.
[26]The enemy may make the U.S. Army operate in a non-contiguous environment. This possibility must be acknowledged, if for no other reason, than the U.S. Army doctrine does not mention this possibility. The acknowledgement of this fact has doctrinal implications. The U.S. Army's force projection posture, places a heavy reliance on aerial (APOD) and seaports (SPOD) to gain access to respective theaters of operation. This reliance on air and seaports will not go unnoticed by potential adversaries of the United States. The reliance on aerial and seaports during Desert Storm was a perfect example of the U.S. need for ports and the vulnerability that a potential adversary could exploit. Forcing the United States to utilize less than optimal ports could potentially cause the U.S.

Army to utilize ports separated by vast distances. The dilemma of having to use multiply sea and airports of embarkation could easily create a non-contiguous AO for U.S. forces--at the enemies choosing not the United States Army. Moreover this possibility represents a completely new dynamic to the operational environment. The critical component associated with this new dynamic is that current commanders and staffs have little to no experience dealing with this potentiality—enemy dictating the AO. The lack of combined experience directly impacts on the ability to recognize patterns—a topic discussed later. A non-contiguous AO, dictated by the enemy, possess an interesting and completely new problem set for decision-makers.

[27] Ibid., 4-20.

[28] Ibid., 4-20.

[29] Department of the Army, *Field Manual 6-60 MLRS Operations* (Washington, D.C., U.S. Government Printing Office, 1999), 14-20. Block 1 missiles have an unclassified range of 160km and Block 1a have an unclassified range of 300km.

[30] *ST 3-0, Operations,* 2-2, 2-3.

[31] Ibid., *4-21*.

[32] FM *100-5, Operations,* (1986) 35.

[33] Ibid., 4-22.

[34] *ST 3-0, Operations,* 4-22, makes a point to acknowledge that deep, close, and rear operations have application when a spatial relationship is required, like in a contiguous linear AO or when operating with coalition forces. When the combat zone is difficult to define, decisive, shaping and sustaining operations become more constructive.

[35] *FM 100-5, Operations,* appendix B.

[36] *ST 3-0, Operations,* 5-11.

[37] Ibid., 5-11.

[38] *FM 101-5 Staff Organization and Operations,* 5-12.

[39] Marvin S. Cohen and Bryan B. Thompson, *Rapid Capturing of Battlefield Mental Models,* Technical Report 95-3, (U.S. Army Research Institute, Fort Leavenworth, KS, 1995). Cohen and Thompson also acknowledge the validity of the RPD model.

[40] Klein, 2. Defines sources of power as those analytical abilities of breaking a problem into elements and performing basic operations on these elements as a way of solving a problem. 2.

[41] Ibid., 17.

[42] Ibid., , 3.

[43] Ibid., 95.

[44] Ibid., 11-12, 103.

[45] Ibid., 3.

[46] Ibid., 3.

[47] Ibid., 20.

[48] Klein states that the standard advice for better decisions included identify all relevant options, define all important evaluation criteria, weight the importance of criteria, evaluate each option in each criteria and tabulate results and select a winner.

[49] Ibid., 17.

[50] Ibid., 103.

[51] Ibid., 103.

[52] Ibid., 140-144.

[53] Ibid., 17.

[54] Ibid., 24.

[55] James Kahan, Robert Worley and Cathleen Stasz, *Understanding Commanders' Information Needs,* (Santa Monica: Rand, 1989), 44.

[56] Klein, 97 validated the RPD against Battle Command teams at Roving Sands (Joint Exercise), AEGIS commanders U.S. Army Division staffs and below. Marvin S. Cohen and Bryan B. Thompson, 6. Acknowledges the applicability and validity of the RPD model in the military decision-making process.

[57] Ibid., 99.

[58] Ibid., 142.

[59] Ibid., 52.
[60] Ibid., 53.
[61] It is interesting to note that Klein determined that mental simulations rarely involved more than six transitions with usually three variables. Additionally, in the RAND study, Kahan, 23, states the functional roles assigned to various staff streamline the image sharing process because everyone doesn't have to know everything. Knowledge is distributed among specialists, each of whom communicates his portion of the image. This distributed knowledge base is not only efficient but also necessary since a single individual cannot grasp all of the detailed complexities of modern warfare. The commander's role is that of a generalist; he must leave the details to the staff.
[62] Ibid., 64.
[63] Ibid., 89.
[64] Ibid., 89.
[65] James F. Kahan, 18. Kahan offers an incredibly insightful perspective on the application of shared vision between the commander and staff. The application is directly linked to the notion of vision as described in *ST 3.0, Operations*. More importantly this concept can guide planners on how the MDMP is conducted to provide this shared vision.
[66] Kahan, 14, states "a commander typically makes his decisions before the decision briefing takes place; hence, the main function of that meetings is to provide a common context in which those decisions can be understood."
[67] Ibid., 17-19.
[68] Ibid., 43.
[69] Klein, 150.
[70] Henry Mintzberg, *The Rise and Fall of Strategic Planning*, (New York, NY, Freedom Press, 1994), 327.
[71] Klein, 95.
[72] Ibid., 325.
[73] *ST 6-0, Command and Control*,, 2-13.
[74] *FM 101-5, Staff Organization and Operations*, 5-3 – 5-4.
[75] This statement is a personal observation taken from nineteen years of experience in the Army. A perfect example of the ripple effect created by poor mission analysis is the huge amount of time needed to conduct the first wargame as compared to the second wargame. During the first wargame the staff finds themselves asking questions like: "how wide is the road network?, How much weight will that bridge support?, What is the slope of hill?, Is a particular enemy formation supposed to be here? All these questions resulted from poor mission analysis. Once all the holes in the mission analysis are resolved the subsequent wargaming efforts go relatively smooth.
[76]This statement is a personal opinion based on nineteen years active duty time. This perspective is taken from jobs held at the Brigade and Battalion level. Additionally, this opinion was revalidated during my two year at Command and General Staff College and the School of Advanced Military Studies. Students continued to produce briefings dictated by the MDMP process without any discussion about why they were briefing. Mission analysis is so often seen as a series of steps, without much thought given to its true importance to the process—the creation of a shared and communicated visualization.
[77] *ST 6-0, Command and Control*, 2-16.
[78] Carl Von Clausewitz, *On War*, Edited by Michael Howard and Peter Paret, (Princeton, NJ, Princeton University Press, 1976), 102.
[79] Ibid., 102.
[80] *ST 3-0, Operations*, 5-2 – 5-3.
[81] *ST 6-0, Command and Control*, 2-16.
[82] *ST 3-0, Operations*, 5-3.
[83] Joint Publication 5-00.1, *JTTP for Joint Campaign Planning*, (U.S. Government Printing Office, Washington D.C., 1 February 2000), H-4.
[84] *ST 6-0, Command and Control*, 2-14.
[85] Ibid., 2-15.
[86] Marvin S. Cohen, *Rapid Capturing of Battlefield Mental Models*, (United States Army Research Institute, Fort Leavenworth Field Unit, Fort Leavenworth, KS, 1995), 5.
[87] Clausewitz, 102.
[88] Ibid., 102.

[89] Ibid., 2-16.
[90] *FM 101-5, Staff Organization and Operations*, 5-11 – 5-16.
[91] Ibid., 5-11.
[92] Ibid.,5-2. Both the Commander's estimate and the staff's estimate are a continuous process.
[93] Ibid., 5-16.
[94] *FM 101-5, Staff Organization and Operations* do not dictate that the commander removes himself from the wargaming effort. This statement simply reflects the reality in most Army units.
[95] Ibid., 5-16.
[96] The Marine Corps Planning Process, contained in *MCWP 5.1*. The decision-making process articulated in this manual is virtually identical in form and in execution to the U.S. Army's. Therefore the comments by the author on the process are applicable to this monograph.
[97] John F. Schmitt, "How We Plan," *Marine Corps Gazette*, (October 1999): 23-24.
[98] *FM 101-5, Staff Organization and Operations*, 5-17. The wargaming steps include, in order, the gathering of tools, list all friendly forces, list assumptions, list known critical events and decision points, determine evaluation criteria (for comparison), select the wargame method (box, belt, avenue in depth), select a method to record results, finally wargame the battle and assess the results. The first five steps listed clearly must occur during mission analysis and COA development if those steps are conducted with any fidelity. This provides further evidence that the wargaming process might be utilized in a different manner than in just the COA analysis step of the MDMP.

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